NARRAGUAGUS RIVER

MAINE

SURVEY

(REVIEW OF REPORTS)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS WALTHAM, MASS.

APRIL 10,1962

SURVEY (REVIEW OF REPORTS)

NARRAGUAGUS RIVER, MAINE

SYLLABUS

The Division Engineer finds that the Narraguagus River channel to Milbridge is inadquate for commercial fishing carriers bringing fish to the canneries, and that reduced fish spoilage and increased fish catch benefits are sufficient to warrant Federal improvement. He recommends a project to provide a channel 11 feet deep to Wyman, 9 feet deep to Milbridge, and 6 feet deep to a proposed Town landing, with extra width at Milbridge and near the Town landing for anchorage. The total project cost is (March 1962) $535,000 and the benefit cost ratio is 1.6.

The project is recommended subject to the requirement that local interests provide lands, easements and rights-of-way, including spoil disposal areas; hold and save the United States free from damages; provide and maintain a suitable public landing; and make berth and dock improvements at the terminals. Costs to local interests are estimated at $5,000 for spoil areas, $10,000 for the landing, and $11,000 for the berth and dock improvements. The cost to the United States is $500,000 for construction, $7,000 for preauthorization studies and $2,000 for additional navigation aids. Future annual maintenance costs are estimated at $7,500 for dredging and $400 for the navigation aids.

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Maps Accompanying Report:

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 Trapelo Road
Waltham 54, Mass.

NEDGW 10 April 1962

SUBJECT: Survey (Review of Report) of Narraguagus River, Maine

TO: Chief of Engineers, ATTN: ENGCW-P, Department of the Army, Washington 25, D. C.

AUTHORITY

1. This report is submitted in compliance with a resolution adopted on 27 June 1956 by the House Committee on Public Works, which reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE HOUSE OF REPRESENTATIVES, UNITED STATES, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Narraguagus River, Maine heretofore submitted to the Congress, with a view to determining what improvements for navigation are advisable at this time."

2. A study of survey scope was directed by the Chief of Engineers to the New England Division on 1 August 1956.

PURPOSE AND EXTENT OF STUDY

3. This study considered what modification of the existing Federal navigation project for the Narraguagus River at Milbridge, Maine would be needed to meet the desires of local interests for deepening and straightening the channel in the interests of fishing commerce. Detailed hydrographic and topographic surveys were made to determine existing channel depths and conditions, as well as the location and elevations of existing piers and jetties. Extensive soundings and selected probings were made in the areas desired for improvement and compared with available maps and other subsurface data to determine the type, location and volume of materials to be removed. A public hearing was held on 17 December 1957 at the Milbridge Town Hall to obtain the views of local interests on

desired navigation improvements of the Narraguagus River. Subsequent meetings were held with local interests and town officials on 11 November 1960 and 29 August 1961 to discuss local cooperation requirements and obtain up-to-date statistical information and the views of local interests. Engineering and economic studies of desired improvements were made, based upon the information furnished and on available maps, charts and aerial photographs.

DESCRIPTION

4. The Narraguagus River rises in Eagle Lake, Hancock County, and flows in a general south-southeasterly direction for a distance of about 49 miles where it empties into Narraguagus Bay and the Atlantic Ocean. The Narraguagus River is located about 10 miles west of Jonesport and 25 miles east of Southwest Harbor. Bar Harbor is about 20 miles to the west and Machiasport about 25 miles to the east.

5. The river basin is located in Hancock and Washington counties in northeastern Maine about 35 miles east of Bangor. The basin area is approximately 240 square miles with a length of 35 miles and a width varying from 2 to 16 miles. The total fall of the river is 406 feet. The river is tidal below Cherryfield with tide ranges of 3 to 7 feet at Cherryfield and 10 to 14 feet at the mouth of the river. Only the river reach below Milbridge, about 2 miles above the mouth, is normally used for navigation. The present channel is used by sardine carriers which service three canneries on the river. The controlling depths are 6 feet at the entrance bar off Wyman and about 5 feet in the river to Milbridge. During the summer months a few recreational yachts use the waterway but due to the winding nature and shoal areas in the river, navigating of the river without local knowledge is considered hazardous. The locality is shown on U. S. Coast and Geodetic Chart No. 305, the Army Map Service Cherryfield and Harrington Quadrangles, and the maps accompanying this report.

TRIBUTARY AREA

6. The area tributary to the Narraguagus River consists of the village of Wyman at the mouth of the river and the village of Milbridge about two miles upstream, which form the main population centers of the town of Milbridge. The Town has a population of about 1,100 and an assessed valuation of about $950,000. The principal commercial activity in Milbridge is the canning of seafood products. U. S. Route 1 follows the Narraguagus River from Milbridge for about 4 miles to Cherryfield, and crosses the river near the head of tidewater at the south side of Cherryfield. The Maine Central Railroad passes through Cherryfield at the north side of the village, immediately downstream of the recently constructed Cherryfield Dam.

BRIDGES

7. There are no bridges downstream of Milbridge in the area considered by this report. Two bridges on U. S. Route 1A, separated by a ledge and fill area near the middle of the river, cross the Narraguagus at the north side of Milbridge. A fixed bridge over the east channel, deeper of the two channels, has a horizontal clearance of about 117 feet and a vertical clearance of about 5 feet above mean high water. A swing bridge over the west channel has a horizontal clearance of about 28 feet and a vertical clearance of about 5 feet above mean high water when the span is closed.

PRIOR REPORTS

8. The Narraguagus River has been the subject of two previous navigation reports and two flood control reports. The original navigation report in 1870, printed as House Ex-Document No. 60, 41st Congress, 3rd Session, recommended the betterment of navigation above Milbridge by the removal of obstructions, such as mill waste and sunken boulders. The second report, printed as Senate Ex-Document No. 29, 46th Congress, 3rd Session was submitted to Congress in 1880 and recommended dredging a channel 200 feet wide and 11 feet deep for about 0.8 mile upstream to the original location of the Lower Steamboat Wharf, and then 9 feet deep to a natural anchorage off Fickett Point known as "Deep Hole".

9. An unfavorable flood control report in 1949 recommended that no improvement of the Narraguagus River be undertaken at that time. Following major flooding in April 1959, a small flood control project was authorized in 1960 by the Chief of Engineers under the provisions of Public Law 685, 84th Congress, 2nd Session.

EXISTING CORPS OF ENGINEERS PROJECTS

10. In 1871 and 1872 appropriations totaling $22,000 were made for removal of boulders, ledges, slabs and other obstructions which hindered navigation of small craft between Milbridge and Cherryfield. This work was completed in 1874.

11. Appropriations totaling $50,000 were made in 1886, 1888, 1890, 1892, 1894, 1896 and 1899 for improvement of the river below Milbridge. The existing navigation project provides for dredging a channel 200 feet wide and 11 feet deep at mean low water from deep

water in Narraguagus Bay to the original location of Lower Steamboat Wharf, thence 9 feet deep to the anchorage known as "Deep Hole", a total length of 1.5 miles. The existing project was completed in 1904, to Mitchell Point. A relocation of the steamboat wharf obviated the need for further dredging above that point. With the availability of an 11-foot access depth at the new steamboat wharf, the main object of the improvement was considered accomplished.

12. The total cost of this new work was $72,000. No maintenance has been performed and no average annual cost of maintenance has been determined. The project was recommended for abandonment in House Document No. 467, 69th Congress, 1st Session, but no action was taken by Congress.

13. The flood control project at Cherryfield provides for a rock-filled timber crib dam upstream of Cherryfield to reduce ice-jam flooding. The project was constructed in 1961 and included construction of a fishway to permit upstream movement of migratory fish. The total cost of this project was $225,000, of which the Federal share amounted to about $220,000 and the value of the non-Federal contributions totaled about $5,000.

LOCAL COOPERATION ON EXISTING AND PRIOR PROJECTS

14. Under the provisions of the River and Harbor Acts of 11 July 1870 and 14 June 1880, local interests were not required to meet any conditions of local cooperation. Local interests have met the requirements of local cooperation for the small flood-control project at Cherryfield.

OTHER IMPROVEMENTS

15. Local interests have made no general navigation improvements.

TERMINAL AND TRANSFER FACILITIES

16. There are four major wharves fronting on the Narraguagus River. One is located on the east bank a short distance downstream of the highway bridge, two are on the west bank in Milbridge, and the fourth is located near the mouth of the river at Wyman. All are privately owned and in fair condition. No storage or repair facilities are available. Diesel oil and gasoline are obtainable by tank truck delivery. Fish pump facilities are available at the upper dock at Milbridge and at the Wyman dock.

17. The dock opposite Milbridge is owned by the Partridge Island Weir Company, an inactive fish cannery and lobstering firm, and has 10 feet of water at the head. The plant sustained a ruinous fire in 1960 and the partly damaged wharf has not been rebuilt to date. The upper wharf at Milbridge, of wood piling construction, is owned by the Milbridge Canning Corporation and has a 60-foot berth and 8-foot depth at mean low water. Upper Steamboat Wharf, the lower wharf at Milbridge, is of crib construction and has a 100-foot berth with 4.6 feet of water at mean low water. Also known as "Sawyer Wharf" or the "Town Wharf", the wharf is open to the public and is occasionally used by the L. Ray Packing Company, whose carriers can only unload at high tide at their cannery wharf near the head of Upton Cove at the south side of Milbridge. The Jasper Wyman & Son Wharf at Mitchell Point in Wyman is of wood piling construction and has a 30-foot berth with 2 feet of water at mean low water.

18. The Town of Milbridge voted in September 1961 to purchase the Partridge Island Weir Company wharf for development as a public landing. The L. Ray Packing Company has purchased the former Standard Oil Dock ruins at the south side of Sawyer Wharf and proposes to construct dock facilities which would front on the main channel.

IMPROVEMENT DESIRED

19. In December 1957, a public hearing was held in the Milbridge Town Hall to determine the desires of the local interests on the type of improvement needed for Narraguagus River. The hearing was well attended by representatives of Federal, State and local governments, commercial canneries, fishermen, local businessmen and individuals. A committee of the Chamber of Commerce summarized the need for a channel 11 feet deep from Narraguagus Bay to Deep Hole, thence 9 feet deep to the site of a proposed town landing, and with an anchorage near the landing. This improvement is needed for the 3 canneries and the lobster fishermen. Some of the lobstermen also requested sheltered anchorage in Turner Cove at the river mouth.

EXISTING AND PROSPECTIVE COMMERCE

20. The principal item of commerce on the waterway is herring, which is brought in to the 3 canneries. Landings of this highly perishable fish have fluctuated from year to year. Although commercial statistics are incomplete, the Fish and Wildlife Service reports

that present annual herring landings are about 6,000 tons. The three canneries which process the herring are L. Ray Packing Co., Jasper Wyman & Son and the Milbridge Canning Corporation. In addition about 22 tons of lobster are landed annually. The Fish and Wildlife Service estimates that the desired channel improvements would increase sardine fish landings by 15 percent or about 900 tons. No significant increase in lobster landings is anticipated as a result of improvements.

VESSEL TRAFFIC

21. The waterway is presently used by commercial sardine carriers, seiners, trawlers and lobster boats. The present controlling depth of 5 feet at mean low water on the bar limits use of the waterway for the vessels that have a loaded draft of 9 feet or more to periods of half tide or higher tide stages. There are 6 carriers, 2 trawlers and 6 seiners averaging 60 foot in length and 9 foot loaded draft valued at about $200,000 presently using the river. There are also about 36 lobster boats averaging 25 feet and loaded draft of 4 feet using the waterway. This fleet is valued at $72,000. There were about 250 trips by sardine carriers in 1960. No record is kept of the number of trips by other vessels. The desired improvement would permit navigation by the existing fishing boats at all stages of the tide. No increase in draft in future fishing boats is anticipated. No increase in the number of boats using the river is anticipated, although the number of vessel trips would increase.

22. There are 15 outboards, 4 small sailboats and one larger recreational boat based on the river. There are no facilities for recreational boating and few transient boats visit the area. While the improvement desired might reduce the navigation difficulties for recreational boats no increase in boating is expected as a result of the improvement.

DIFFICULTIES ATTENDING NAVIGATION

23. The principal difficulties to navigation are shallow depths and the winding of the natural channel to Milbridge. During periods of low-visibility, navigation of the river is considered hazardous, even for boat captains with local knowledge of the river. The 5-foot controlling depth prevents loaded sardine carriers from entering the river and proceeding to the canneries except at half tide and over. Numerous groundings were reported

at the hearing, but as the shoals and channel banks are generally composed of sand and sawdust, damage was minor consisting mostly of bent propellors and shafts. There were also reports of vessels being struck while anchored in the channel. No tally of repair costs was available. Increased depth, straightening the channel, and provision of anchorage outside of the channel would substantially reduce navigation difficulties.

WATER POWER AND OTHER SPECIAL SUBJECTS

24. The improvement under consideration would have no direct relation to flood control, pollution, irrigation or water power. The U. S. Fish and Wildlife Service has reported (See Appendix C) that siltation from dredging activities may interfere with migration of Atlantic salmon, but that this effect could be minimized by proper scheduling of construction. They also indicate that controlled spoil disposal on land would have no significant damages to fish and wildlife resources.

PLAN OF IMPROVEMENT

25. The improvements requested by local interests at the public hearing have been considered. They requested a channel 11 feet deep to Deep Hole and thence 9 feet deep to Milbridge to an anchorage dredged near the proposed Town Landing. It was found that a channel width of 200 feet to Deep Hole and 150 feet to Milbridge was not needed for powered vessels, as it had been for sailing craft when the existing project was designed. The 9-foot deep channel above Deep Hole would meet the needs of navigation except in the channel below Wyman, where 11 feet is needed because of wave action.

26. Certain lobster fishermen also requested dredging of Turner Cove or construction of a breakwater to provide sheltered anchorage to permit them to fish all winter. At the present time, the fishermen haul their boats during the winter months as there is no protection from the severe storms experienced at that time. The existing lobster fleet is composed of about 25 full-time fishermen and 11 part-time fishermen. Some local interests indicated that perhaps one-half of the full-time lobstermen would fish all year if adequate protection was available, but other local interests doubted seriously if any lobster fishermen would fish at all in the wintertime. Ledge areas in Turner Cove would make dredging the desired anchorage very costly there. Because suitable anchorage could be constructed at Milbridge at low cost, no further consideration was given to improving Turner Cove.

27. The plan of improvement that will best serve the present and foreseeable use of the waterway would provide a channel 11 feet deep 150 feet wide from deep water in Narraguagus Bay to Wyman, 9 feet deep 100 feet wide up the river to Milbridge and widened opposite Milbridge for anchorage, and 6 feet deep 100 feet wide to the proposed Town landing and widened for anchorage near the landing.

SHORELINE CHANGES

28. It is not expected that channel dredging would effect the configuration of the adjacent shoreline.

REQUIRED AIDS TO NAVIGATION

29. The United States Coast Guard is presently maintaining 9 channel markers and a day-beacon. They were consulted concerning the need for additional navigation aids and advised that 4 additional channel markers will be needed to properly mark the improvement. The initial cost of these aids is $2,000, and the additional annual maintenance for them is $400.

ESTIMATE OF FIRST COST

30. An estimate has been made of the first cost of the selected plan of improvement. Channel dredging would be accomplished by the Corps of Engineers, and additional navigation aids would be placed by the Coast Guard. Local interests would provide spoil disposal areas, a public landing, deepen berths and improve docking facilities. The cost estimate is based on March 1962 price levels and includes an allowance for contingencies.

Project Construction Cost

Corps of Engineers	
Channel Dredging	$450,000
Preauthorization Study	7,000
Engineering and Design	17,000
Supervision and Administration	33,000
	$507,000
U. S. Coast Guard	
Additional Navigation Aids	$2,000

Local Interests

Spoil Disposal Areas	$ 5,000
Public Landing (Self-liquidating)	10,000
Berth and Dock Improvements (Self-liquidating)	11,000
	$26,000
Total project cost (March 1962)	$535,000

ESTIMATES OF ANNUAL CHARGES

31. The annual charges for the improvement above have been computed using a project life of 100 years and a Federal interest rate of 2 5/8 percent. Interest and amortization for the spoil disposal area cost, the only non-Federal cost that is not self-liquidating, was computed using an interest rate of 4 percent for 25 years. The cost of periodic future channel maintenance dredging has been estimated as an average annual cost.

Project Annual Charges

Federal

Interest and Amortization	$14,400
Maintenance: Dredging	7,500
Navigation Aids	400
	$22,300

Non-Federal

Interest and Amortization	300
	$22,600

ESTIMATES OF BENEFITS

32. Benefits have been evaluated for improvement of the Narraguagus River by deepening and straightening the existing and natural channel from deep water in Narraguagus Bay to Milbridge. The major benefit is to commercial fishing from the elimination of fish spoilage and from increased fish landings. Present conditions have caused some carriers to run aground and others to miss a favorable tide, thus causing spoilage of the herring catches aboard.

The operators of the canneries indicate that due to tidal restrictions full production cannot be obtained. The U. S. Fish and Wildlife Service has reported that the improvement would result in a 15 percent increase in the annual fish landings. In addition spoilage losses equal to 15 percent of the present catch would be eliminated. The improvement would therefore increase the amount of fish available by 30 percent, which is 1,800 tons a year. The net annual value of the increased catch at the dock is $14,400. The net annual value of the spoilage losses that would be eliminated is $21,600. Therefore the annual benefit for the improvement is $36,000.

33. The improvement would reduce navigation difficulties in the present channel and reduce vessel damages from groundings. Provision of anchorage areas at Milbridge will reduce the collision danger for vessels using the channel. The anchorages will also provide shelter for lobster boats that are now moored in less protected areas. Because repair cost records have not been kept, the reduction of vessel damages has not been evaluated. The lobster fishermen would benefit, especially from the convenience of the proposed public landing with adequate anchorage nearby. Because the U. S. Fish and Wildlife Service reports that no significant increase in lobster catch would result, no benefit to the lobster boats has been evaluated. Recreational boat navigation would be easier because of the improvement, but there is no indication that there is any benefit from increased recreational boating activity which could reasonably be evaluated.

COMPARISON OF BENEFITS AND COSTS

34. Comparison of the estimated annual benefits totaling $36,000 and the estimated annual charges totaling $22,600 results in a benefit-cost ratio of 1.6 to 1.

PROPOSED LOCAL COOPERATION

35. The benefits to be derived from this improvement are general in nature and therefore local interests should not be required to contribute towards the first cost of construction. Local interests should be required to provide without cost to the United States all lands, easements and rights-of-way necessary for construction and maintenance of the improvement. Because construction by hydraulic dredge with disposal on land would be less costly than by

bucket dredge with disposal at sea, local interests should provide suitably diked spoil disposal areas on land. There are numerous places along both banks of the river which could hold the estimated amount of material to be removed. The U. S. Fish and Wildlife Service anticipates no adverse effects on fish and wildlife resources from spoil disposal on land. Local interests have indicated that spoil to provide land for parking purposes near the Town landing could be used advantageously.

36. It is considered that anchorage near Milbridge would not be fully utilized by the lobster boats if adequate docking facilities are not available, and these boats would continue to moor in the channel downstream. At the present time the Upper Steamboat Wharf (Sawyers) is open to the public but the condition of the wharf and lack of facilities do not permit its use in such a manner as to be considered adequate. Local interests should be required to provide a public landing with attendant facilities open to all on equal terms. The Town has voted to purchase the Partridge Island Weir Company wharf, razed by fire in 1960, and rebuild it as a public landing. This pier would have ready access to the anchorage and to the Town of Milbridge.

37. Full use of the improved channel would not be assured unless the berths at the Milbridge Canning Corporation and Jasper Wyman and Son docks are deepened, and docking facilities for the L. Ray Packing Company are improved. Therefore it is considered that berth and dock improvements should be required as a condition of project construction.

APPORTIONMENT OF COSTS AMONG INTERESTS

38. Since all evaluated benefits are general in nature, the entire cost of construction of the channels and anchorages should be borne by the Federal Government. The cost of spoil disposal areas, the public landing and improving berths and docks should be considered a local expense.

COORDINATION WITH OTHER AGENCIES

39. All Federal, State and local agencies having an interest in the improvement were notified of the public hearing held at Milbridge on 17 December 1957. Subsequent to the hearing, local interests were consulted to obtain additional information and obtain their comments on the plan of improvement and the proposed requirements of local cooperation.

40. The Coast Guard reviewed the plan of improvement and advised on additional navigation aids required to properly mark the proposed improvement. The U. S. Fish and Wildlife Service consulted with the Maine Departments of Sea and Shore Fisheries, Inland Fisheries and Game, and the Atlantic Sea-Run Salmon Commission and reports that the increased catch can be sustained by present sardine resources. If dredging is carefully scheduled, there is no objection to the plan of improvement as it affects their interests. See Appendix C. The State of Maine, through the agency of the Maine Port Authority, has approved the plan of improvement. The Milbridge Town Manager, Selectmen and the 3 cannery operators have reviewed the recommended plan of improvement and have indicated that it meets with their approval, and that the requirements of local cooperation would be met.

DISCUSSION

41. The Narraguagus River is one of the "Down East" harbors between Bar Harbor and Jonesport. While many of the small harbors along this coast are used by lobster-fishermen, the Narraguagus River in addition to the lobster-fishing business has 3 canneries that pack sardines caught offshore. The community is dependent upon the canneries for a substantial portion of its income. There is some tourist business but recreational boating has not yet become important in this area of Maine. Washington County, which includes Milbridge, has been classified as a distressed area under the Area Redevelopment Act, which was signed into law in May 1961.

42. Existing conditions in the river restrict the operations of sardine carriers bringing fish to the canneries. An adequate channel would reduce losses from spoilage and permit increased fish landings. In addition, navigation hazards would be reduced if the fleet of lobster boats could be moored near adequate landing facilities at Milbridge.

43. The existing Federal project for the Narraguagus River has not been maintained since 1904. Because present depths are now much the same as natural conditions prior to construction of the existing project, rehabilitation of the existing project would be more expensive than construction of the plan of improvement selected as best meeting present and prospective navigation needs.

CONCLUSIONS

44. A plan of improvement to satisfy the existing and foreseeable need of navigation would provide a channel 11 feet deep 150 feet wide to Wyman, 9 feet deep 100 feet wide to Milbridge and widened opposite Milbridge for anchorage, and 6 feet deep 100 feet wide to the proposed public landing and widened for anchorage near the landing. Benefits from reduced fish spoilage and increased fish catch, evaluated at $36,000, are sufficient to justify the work as is indicated by a benefit-cost ratio of 1.6. All benefits are general in nature; therefore, none of the cost of construction will be required of local interests. Local interests have approved the plan and indicated that they are willing and able to meet the requirements of local cooperation of the project.

45. Continuance of the existing Federal project would serve no useful purpose.

46. The net cost of this improvement to the United States is estimated at (March 1962) $500,000 for construction and $7,500 annually for maintenance. Other Federal costs are $7,000 for preauthorization studies and $2,000 for additional navigation aids with $400 annually for maintenance of these aids. Non-Federal costs are estimated at $5,000 for spoil disposal areas, $10,000 for the public landing and $11,000 for dock and berth improvements.

RECOMMENDATION

47. The Division Engineer recommends that the existing Federal navigation project for the Narraguagus River be abandoned and in lieu thereof a project authorized to provide a channel 11 feet deep 150 feet wide from deep water in Narraguagus Bay to Wyman, 9 feet deep 100 feet wide to Milbridge and widened opposite Milbridge for anchorage, and 6 feet deep 100 feet wide to the proposed Town landing and widened near the landing for anchorage.

48. The project is recommended subject to the condition that local interests:

a. Provide without cost to the United States all lands, easements and rights-of-way required for construction and subsequent maintenance of the project and of aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of spoil and necessary retaining dikes, bulkheads and embankments therefor or the costs of such retaining work.

b. Hold and save the United States free from damages due to construction and maintenance of the project.

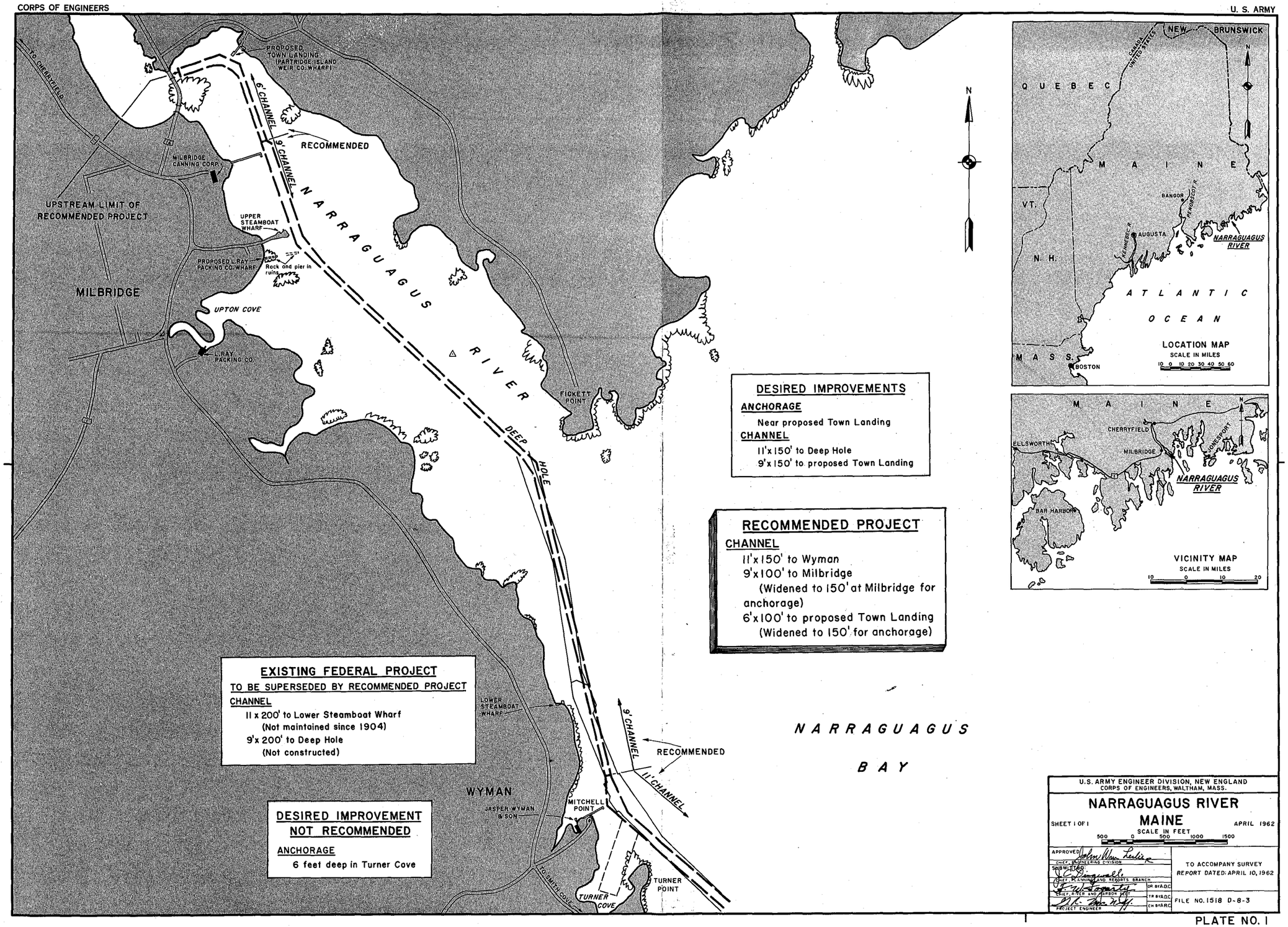
c. Provide and maintain at local expense a suitable public landing at Milbridge with adequate supply facilities open to all on equal terms and in accordance with plans approved by the Chief of Engineers.

d. Provide and maintain without cost to the United States adequate docking facilities at the terminals with berth depths commensurate with the Federal channel.

OTTO J. ROHDE
Colonel, Corps of Engineers
Acting Division Engineer

CORPS OF ENGINEERS

U. S. ARMY



DESIRED IMPROVEMENTS

ANCHORAGE

Near proposed Town Landing

CHANNEL

11'x 150' to Deep Hole

9'x 150' to proposed Town Landing

RECOMMENDED PROJECT

CHANNEL

11'x 150' to Wyman

9'x 100' to Milbridge
(Widened to 150' at Milbridge for anchorage)

6'x 100' to proposed Town Landing
(Widened to 150' for anchorage)

EXISTING FEDERAL PROJECT

TO BE SUPERSEDED BY RECOMMENDED PROJECT

CHANNEL

11 x 200' to Lower Steamboat Wharf
(Not maintained since 1904)

9'x 200' to Deep Hole
(Not constructed)

DESIRED IMPROVEMENT NOT RECOMMENDED

ANCHORAGE

6 feet deep in Turner Cove

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

NARRAGUAGUS RIVER
MAINE

SHEET 1 OF 1

APRIL 1962

SCALE IN FEET
500 0 500 1000 1500

APPROVED: John Wm. Leslie Jr. — CHIEF, ENGINEERING DIVISION

SUBMITTED: — CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECT. — OR BY A.D.C.

PROJECT ENGINEER — TR BY A.D.C. — CH BY R.C.

TO ACCOMPANY SURVEY REPORT DATED: APRIL 10, 1962

FILE NO. 1518 D-8-3

PLATE NO. 1

CORPS OF ENGINEERS — U. S. ARMY

E 665000 E 666000 E 667000 E 668000 E 669000 E 670000 E 671000 E 672000 E 673000

MATCH LINE SHEET NO. 2 (REPORT SURVEY)

N 250,000 — N 249000 — N 248000 — N 247000 — N 246000 — N 245000

N

AWASH M.H.W.

AWASH M.H.W.

N-1

LOWER STEAMBOAT WHARF (Relocated in 1896 to Mitchell Point)

SHELLS

100'

RECOMMENDED PROJECT

CHANNEL

9 feet deep to Milbridge

11 feet deep to Wyman

EXISTING PROJECT

CHANNEL

9 feet deep
(Not constructed)

11 feet deep
(Not maintained since 1904)

9' CHANNEL

11' CHANNEL

NARRAGUAGUS

BAY

AWASH M.H.W.

N-2

JASPER WYMAN & SON

AWASH M.H.W.

P-16

P-17

P-18

P-19

P-20

P-21

P-22

P-23

P-24

MITCHELL PT.

WYMAN

TURNER (1959)

FLOOD EBB

LOG WHARF IN RUIN

TURNER COVE

PIER IN RUIN CRIBBING REMAINS

DESIRED IMPROVEMENT NOT RECOMMENDED

ANCHORAGE

6 feet deep

TURNER HILL

AWASH M.H.W.

LIST OF PROBINGS

NUMBER	DEPTH OF WATER	ELEVATION BELOW M.L.W. DEPTH OF PROBE	ELEVATION BELOW M.L.W. PENETRATION	MATERIAL
16	1.0	9.6	8.6	Mud
17	2.6	2.6	0.0	Rock
18	0.5	6.5	6.0	Mud To Rock
19	+0.4	6.5	6.9	Mud To Refusal
20	+1.5	3.5	5.0	Mud To Rock
21	0.0	0.0	0.0	Rock
22	+0.8	7.2	8.0	Mud Stones-Refusal
23	+1.5	6.3	5.8	Hard Pack Mud- "
24	+1.0	2.3	3.3	" " " "

NOTE:

Probings taken by two men forcing a 3/4" pipe by hand to refusal.

NOTE:

Survey of Sept. 8-24, 1959, by J. Rock.

B.M. II is a 3/4" drill hole in ledge about 8' from toe of bank and about 150' south from junction of shore with Upper Steamboat Wharf southerly toe of bank and enclosed in a chiseled square. It is further tied in by an angle from the Doybeacon to the B.M. of 113°-11'-00" and a distance 325.0' while transit occupied △ Station U.S.W.. Elev. above M.L.W. is 14.30 feet.

B.M. 2 (1948) is a standard disk, stamped "No.2 1948", set vertically in rock ledge outcropping flush with ground level on edge of bluff, 58 feet due west of B.M. 1 and at northern end of row of trees at edge of bluff. Elev. above M.L.W. is 18.03 feet.

9-foot contour shown thus: ----------

11-foot contour shown thus: — — — — —

Field books: R.&H. 1704, 1705, 1706, 1710, & 1711.

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

NARRAGUAGUS RIVER, MAINE
REPORT SURVEY

SHEET 1 OF 3 — SCALE IN FEET 300 0 300 600 900 — APRIL 1962

APPROVED: Chief, Engineering Division

SURVEYED: Chief, Planning and Reports Branch

Chief, River and Harbor Sect.

Project Engineer

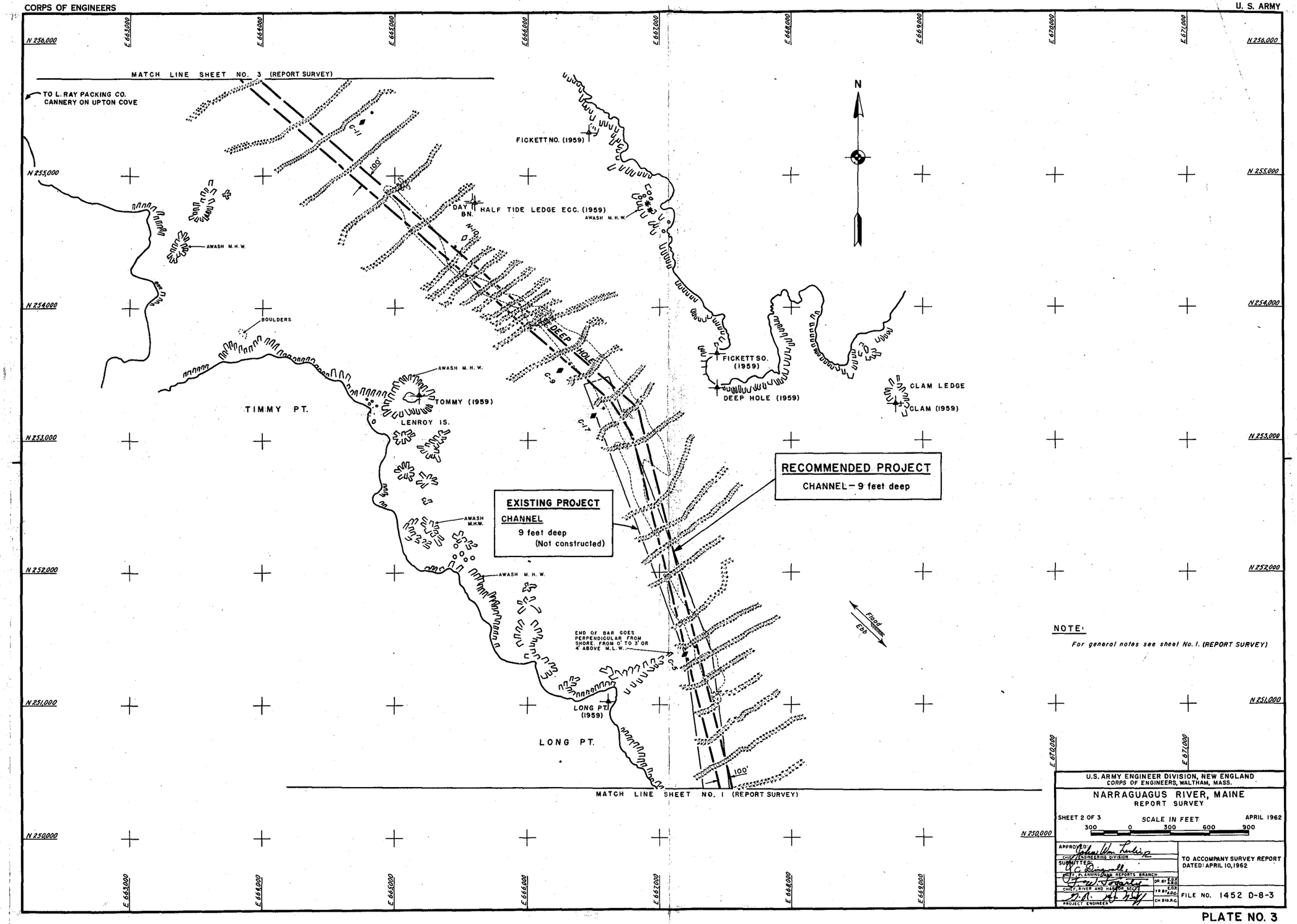
TO ACCOMPANY SURVEY REPORT DATED: APRIL 10, 1962

FILE NO. 1452 D-8-3

PLATE NO. 2

CORPS OF ENGINEERS

U. S. ARMY



NOTE:

For general notes see sheet No. 1. (REPORT SURVEY)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

NARRAGUAGUS RIVER, MAINE
REPORT SURVEY

SHEET 2 OF 3 — SCALE IN FEET — APRIL 1962

300 0 300 600 900

APPROVED: Chief, Engineering Division

SUBMITTED: Chief, Planning and Reports Branch

Chief, River and Harbor Sec. 2

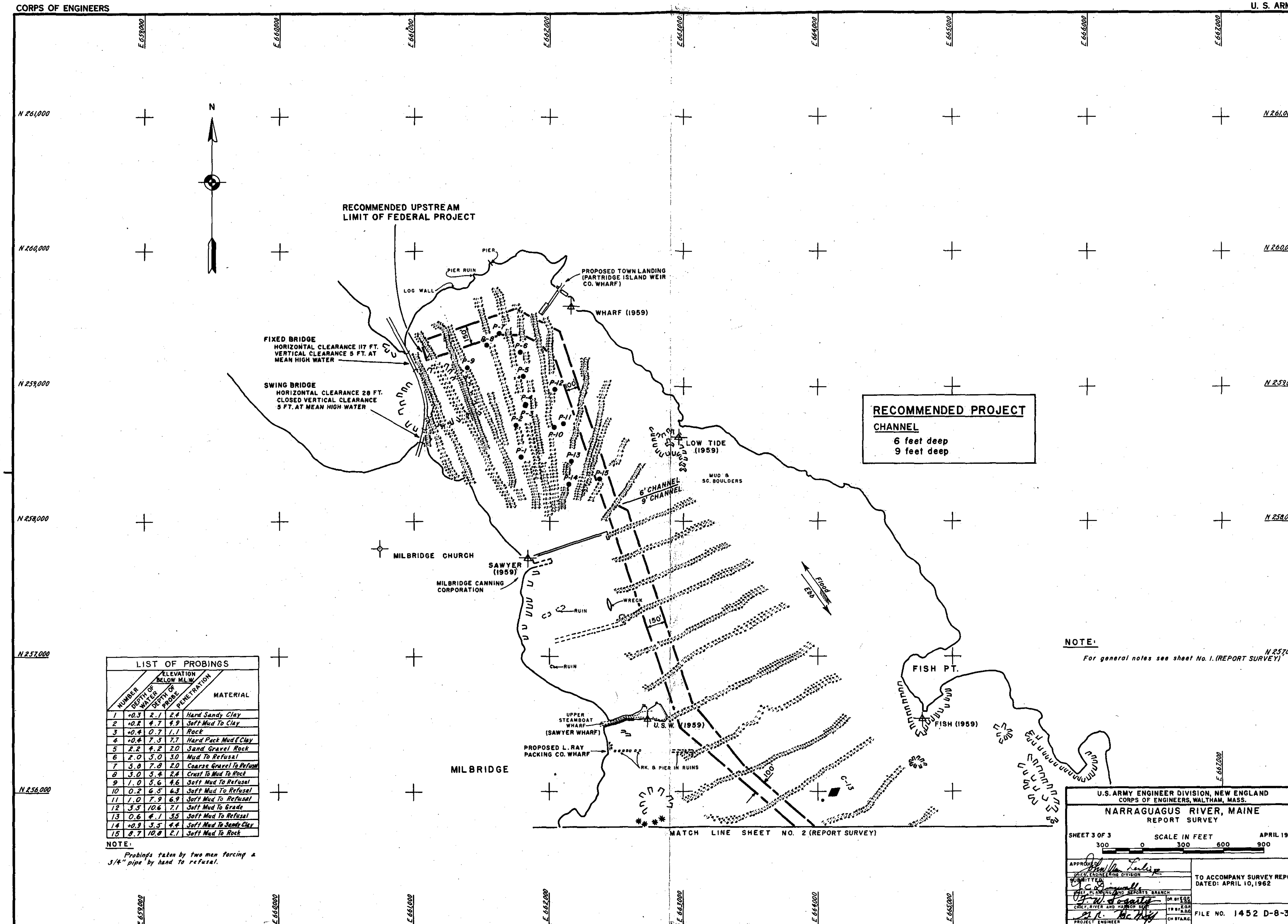
Project Engineer

DR. BY E.O.P.
TR'D A.G.C.
CH'D B.A.G.

TO ACCOMPANY SURVEY REPORT DATED: APRIL 10, 1962

FILE NO. 1452 D-8-3

PLATE NO. 3



LIST OF PROBINGS

NUMBER	ELEVATION BELOW M.L.W. DEPTH OF WATER	ELEVATION BELOW M.L.W. DEPTH OF PROBE	PENETRATION	MATERIAL
1	+0.3	2.1	2.4	Hard Sandy Clay
2	+0.2	4.7	4.9	Soft Mud To Clay
3	+0.4	0.7	1.1	Rock
4	+0.4	7.3	7.7	Hard Pack Mud & Clay
5	2.2	4.2	2.0	Sand Gravel Rock
6	2.0	5.0	3.0	Mud To Refusal
7	5.8	7.8	2.0	Coarse Gravel To Refusal
8	3.0	5.4	2.4	Crust To Mud To Rock
9	1.0	5.6	4.6	Soft Mud To Refusal
10	0.2	6.5	6.3	Soft Mud To Refusal
11	1.0	7.9	6.9	Soft Mud To Refusal
12	3.5	10.6	7.1	Soft Mud To Grade
13	0.6	4.1	3.5	Soft Mud To Refusal
14	+0.9	3.5	4.4	Soft Mud To Sandy Clay
15	8.7	10.8	2.1	Soft Mud To Rock

NOTE:

Probings taken by two men forcing a 3/4" pipe by hand to refusal.

NOTE:

For general notes see sheet No. 1. (REPORT SURVEY)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

NARRAGUAGUS RIVER, MAINE
REPORT SURVEY

SHEET 3 OF 3 — SCALE IN FEET — APRIL 1962

300 0 300 600 900

APPROVED: John Wm Leslie — CHIEF, ENGINEERING DIVISION
SUBMITTED: J. C. Dingwall — CHIEF, PLANNING AND REPORTS BRANCH
F. W. Fogarty — CHIEF, RIVER AND HARBOR SECT.
G. R. McNiff — PROJECT ENGINEER

DR. BY E.O.R. A.D.C.
TR BY E.O.R. A.D.C.
CH BY A.R.C.

TO ACCOMPANY SURVEY REPORT DATED: APRIL 10, 1962

FILE NO. 1452 D-8-3

PLATE NO. 4

SURVEY OF NARRAGUAGUS RIVER, MAINE

APPENDIX A

ESTIMATES OF FIRST COST AND ANNUAL CHARGES

1. First Cost. The first cost of the recommended improvement is given below. Federal construction consists of dredging to provide a channel 11, 9 and 6 feet deep from deep water in Narraguagus Bay to Milbridge. The U. S. Coast Guard has furnished estimates of the cost of additional navigation aids that will be required to properly mark the channel. Non-Federal work consists of providing adequately diked spoil disposal areas, constructing a public landing, improvement of berths, and constructing dock facilities.

2. The materials to be dredged consist of mud, sand, gravel and sawdust, which remains from sawmill wastes dumped in the river for many years. It is expected that the work will be by hydraulic dredge with the spoil placed on nearby land areas. Dredging quantities are in terms of in-place measurement and include 1 foot of additional depth for overdepth dredging, and side slopes of 1 vertical on 3 horizontal. Cost estimates are based on prices prevailing in the area for similar work in March 1962.

3. Local interests are expected to provide the required public landing by reconstruction of the former Partridge Island Weir Company wharf. Berth improvements consist of minor dredging at the Jasper Wyman and Son and the Milbridge Canning Corporation docks at a total cost of about $1,000. The L. Ray Packing Company has reported that they plan to construct docking facilities at their property just south of the Upper Steamboat Wharf. The cost of a gravel and rock roadway with a short timber pier at this location is estimated at $10,000.

4. The detailed estimate of cost is as follows:

PROJECT COST ESTIMATE

Cost Account Number	Item	Cost Estimate (March 1962)
09	Channels - 11', 9' and 6' Channel	
	(Dredging 275,000 c.y. @ $1.43 - $393,000)	
	(Contingencies @ 15% - 57,000)	$450,000
29	Preauthorization Studies	7,000
30	Engineering and Design	17,000
31	Supervision and Administration	33,000
	TOTAL COST (Corps of Engineers)	$507,000
	Non-Federal Contributions	0
	TOTAL NON-FEDERAL COSTS	
	Lands and Damages	0
	Relocations	0
	Other	
	Spoil Disposal Areas	$ 5,000
	Public Landing	10,000
	Berth and Dock Improvements	11,000
	Total Non-Federal Costs	$26,000

SUMMARY OF ESTIMATED COSTS

Federal Cost	
Corps of Engineers	$507,000
U. S. Coast Guard	2,000
	$509,000
Required Non-Federal Costs	
Spoil Disposal Areas	$ 5,000
Public Landing (Self liquidating)	10,000
Berth Improvements (Self liquidating)	11,000
	$ 26,000
TOTAL FEDERAL AND REQUIRED NON-FEDERAL COST	$535,000

5. Annual Charges. The non-self liquidating project costs consist of the Federal cost plus the non-Federal cost for spoil disposal areas. Annual interest and amortization charges have been computed for Federal investment using a project life of 100 years and a Federal interest rate of 2.625 percent. Interest and amortization on the non-Federal investment for spoil areas have been computed using an interest rate of 4 percent for 25 years.

6. Annual maintenance costs are estimated for dredging shoaled areas, and for maintenance of the additional buoys by the Coast Guard. Shoaling of the channel is expected, particularly in the lower mile of the channel near Wyman. Considerable difficulty was experienced in constructing and maintaining the existing project between 1886 and 1899.

7. The problem appears to have been caused by the practice of upstream sawmills dumping sawdust and mill waste into the river. Brought down to the river mouth by floods this material formed a shifting bar in the channel. Maintenance of the project was last done in 1903. Since then the channel has shoaled a maximum of 7 feet, near the edge of the basin at Wyman. It appears that the practice of dumping sawmill wastes in the river stopped before 1920, and the U. S. Fish and Wildlife Service reports that the Atlantic salmon run has been re-established in the river. It is therefore considered that any sawdust banks remaining in the river have become stabilized and compacted so that future maintenance will not be difficult.

8. Maintenance dredging is expected to be needed within a few years after initial construction, because construction will expose relatively easily erodible sawdust banks. It is not considered that advance maintenance dredging would be of any value because there is no way of determining where the shoals will be. After the first maintenance, dredging is expected to be required about every 10 years. The annual average shoaling over the project life is estimated to be 5,000 cubic yards.

9. The annual charges for the recommended improvement are as follows:

INVESTMENT

Federal	$509,000
Non-Federal	5,000
Total	$514,000

ANNUAL CHARGES

Federal

Interest and Amortization (.02838 x $509,000)	$14,400
Maintenance: Dredging (5,000 c.y. @ $1.50)	7,500
Navigation Aids	400
Total Federal	$22,300

Non-Federal

Interest and Amortization (.06401 x $5,000)	300
TOTAL PROJECT	$22,600

SURVEY OF NARRAGUAGUS RIVER, MAINE

APPENDIX B

BENEFITS

1. General. - Studies were made to determine whether tangible commercial, recreational or enhancement benefits would accrue from improvement of channel conditions in the Narraguagus River. Substantial benefits would accrue to the commercial sardine fishing industry. However, it appears that no substantial land enhancement benefits or benefits to lobster fishing, commercial shipping or recreational boating would result from navigation improvements.

2. The Narraguagus River is used by local fishing boats, primarily associated with sardine or lobster fishing operations. The river downstream of Milbridge is used for the transportation of herring from the fishing grounds outside Narraguagus Bay to three active canneries, the Milbridge Canning Corporation, the L. Ray Packing Company and Jasper Wyman & Son Company. The herring are caught by the seiners or impounded in weirs to await the carriers which are either owned by the canneries or independently operated. These carriers transport the herring to the cannery docks where they are usually pumped directly into the canneries for processing. The main obstacle to a normal cycle of operation of catching, transporting, pumping and canning the sardines is the delay encountered by the loaded carriers in crossing the entrance bar off Wyman and the various shoals in the channel leading to the canneries.

3. The sardine is a highly perishable fish and requires expeditious handling when pumped into the carriers, the herring are killed and partially scaled, and as a result must be delivered to the cannery within 8 hours of loading to be acceptable as good quality sardines. A longer period of time will reduce the quality of the herring or result in spoilage. Spoiled herring can only be sold for fertilizer or some other by-product.

4. Although the principal dangers along the present winding channel are buoyed, loaded sardine carriers must limit their fish landing operations to the period between half and full tide because of insufficient channel and berthing depths. If landing operations are started too early, the carriers ground on the relatively soft bottom and must wait for the tide. If landings are delayed, the herring catch may spoil before being processed or the carriers may become stranded and cannot rejoin the seiners.

5. The operators of the canneries indicate that due to tidal restrictions full production cannot be obtained, and the services of the cannery workers cannot be used to the best extent. A loaded carrier should reach each cannery dock by seven in the morning and another by 12 noon. This would result in a full 8 hours of canning production. The majority of cannery workers are women, mostly housewives. When a loaded carrier cannot approach the dock to unload during midday in order to supply the cannery for the afternoon production hours, but must wait until late afternoon or evening to unload, a full shift may be lost as the women are reluctant to work during the evening hours. When they do evening work, the rate of production drops considerably during the following morning. On the other hand, when some do not work to process the herring landed late in the day or during the early evening hours, production is slower and the likelihood of spoilage increases. Cannery operators indicate that the present canning production is about 60 percent of that which could be obtained without tidal restrictions.

6. Increased Fish Landings. - The sardine season is regulated by law from 15 April to 1 December, with the best catches occurring from June to September. The size of the local sardine varies considerably from year to year. The total average tonnage processed by all three canneries is about 6,000 tons per year. The U. S. Fish and Wildlife Service has indicated (see Appendix C) that a 15 percent increase in catch can be tolerated by offshore sardine resources and would result from the improvement. Based upon an average annual landing of about 6,000 tons, this increase would represent an additional sardine catch of about 900 tons per year. With a typical gross revenue of $40 a ton received by the carriers and operating costs constituting about 60 percent of the gross revenue, this additional catch would yield a net benefit of about $16.00 a ton or a total annual benefit of about $14,400.

7. Reduction of Fish Spoilage. - Present channel conditions have caused some carriers to run aground and others to miss a favorable tide, thus causing spoilage of herring catches aboard. Local interests could not document the amount of spoilage caused by groundings or tidal delays. However, they believe that about 25 percent of the gross catch is spoiled annually. The U. S. Fish and Wildlife Service has indicated (see Appendix C) that 15 percent spoilage is considered reasonable. Using this spoilage figure and an average annual landing of about 6,000 tons, this loss amounts to about 900 tons a year, representing a gross revenue loss of about $36,000. Local interests indicate that sardines in poor condition can be sold for $16.00 a ton to reduction plants, leaving a net loss of $24.00 a ton due to spoilage. Assuming an annual spoilage loss of about 900 tons, a net benefit of about $21,600 would accrue to the carriers if the improvement is constructed.

8. Other Benefits. - In addition to the evaluated benefits resulting from the improvement of fish carrier navigation, the study also considered potential benefits from other sources. The U. S. Fish and Wildlife Service indicated there would be no significant increase in lobster landings as a result of channel improvements. The lobster fishing boats based at Milbridge and Wyman currently unload their catches at the pound at the head of Smith Cove, which is located at the west side of the entrance to Narraguagus Bay about 0.8 mile southward of Wyman. It is not anticipated that improvement of the Narraguagus River would materially affect total lobster landings in the Narraguagus Bay area.

9. However, the provision of anchorage area near the proposed Town landing would result in greater convenience to both the lobster fishermen and to the sardine carrier skippers. Most of the lobstermen live in the village of Milbridge and must moor downstream off the cannery wharves at Milbridge or Wyman. The availability of anchorage near the Town landing would reduce the danger of collision for vessels using the channel and would reduce navigation difficulties encountered by the carriers. Provision of an upstream anchorage would also provide protected shelter for the limited number of locally based and transient recreational craft.

10. No records have been kept on losses resulting from storm damage, collision or grounding accidents either to anchored or moving craft. Thus, no harbor-of-refuge benefits or elimination of boat-damage benefits have been evaluated. Local interests report that a natural anchorage immediately upstream of the highway bridge has been used as a refuge, but this anchorage can only be used at high tide because of ledge areas. Construction of an anchorage near the proposed Town landing at Milbridge would provide adequate shelter at all tides.

11. Several grounding accidents are reported each year, particularly to sardine carriers which must approach on the half tide to unload their fish catches. However, no damage estimates or records of repair costs have been reported. Most accidents apparently result only in minor losses as the bottom is relatively free of ledge along the channel and the grounded craft are refloated. Straightening and deepening the channel would reduce this hazard.

12. There is a small recreational boat fleet based in the Milbridge area as follows:

15 outboards (10'-20')	$22,500
4 sailboats (10'-20')	2,000
1 charter cruiser (36'-50')	40,000
Total fleet value	$64,500

It is not anticipated that improvement of the channel would materially benefit the present or future recreational fleet. Although channel straightening may ease navigation somewhat for all boats, the provision of additional channel depth would not affect recreational boating activity. Present recreational boating eastward of the Bar Harbor area is very limited. It is considered that any growth that might accompany or follow improvement of the Narraguagus River would result from natural growth, as existing channel depths do not preclude normal development of a recreational fleet.

13. It is expected that the work will be accomplished by hydraulic dredge with the spoil placed on nearby land areas. Local interests have indicated that some fill could be used in low areas near the proposed Town landing to increase the parking area near the landing. Although such fill may provide additional convenience to boat users, particularly lobster fishermen, the existing parking area at the inactive, fire-damaged cannery appears adequate for basic local needs. In view of extensive undeveloped areas along both banks of the river, it is considered that no measurable land enhancement benefits would result from the improvement or placement of spoil.

14. Summary of Benefits. - The total evaluated annual benefits to the improvement are commercial fishing benefits and thus are classified as 100 percent general in nature. These benefits are summarized below:

Increased Fish Landings (900 T @ $16/T)	$14,400
Reduction of Fish Spoilage (900 T @ $24/T)	21,600
Other Benefits	-
Total Annual Benefits	$36,000

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

August 22, 1961

Division Engineer
New England Division
U. S. Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Dear Sir:

This letter constitutes our conservation and development report on the Narraguagus River, Maine navigation project as it will affect the fish and wildlife resources. These studies have been carried out in cooperation with the Maine Department of Sea and Shore Fisheries and the findings have their concurrence.

Improvements under consideration consist of dredging a channel 150 feet wide and 11 feet deep at mean low water to Wyman, a channel 150 feet wide and 9 feet deep at mean low water from Wyman to Millbridge, and an anchorage about 5 acres in area and 6 feet deep at mean low water in Wyman. It is our understanding that the dredging operations will be performed by bucket and scow with spoil disposal in a designated dumping ground at sea.

We anticipate no significant increase in lobster landings as a result of improvements planned for the Narraguagus River. The lobster fishermen are normally able to unload their catch into the storage facilities of the lobster buyer without important delays due to tidal depths.

The planned improvements will benefit the sardine fishery through increased landings. It is estimated that the annual landings of about 6,000 tons will be increased by an average of 15 percent or 900 tons. Using a dockside price of $40 per ton the gross benefits will amout to $36,000.

The sardine resources are adequate to sustain this increased fishing pressure. The operators of 3 nearby sardine packing plants advise us that they can easily process the additional 900 tons of sardines.

Because costly delays will be largely eliminated as a result of the improvements, fish spoilage will be reduced. It is estimated that an additional 900 tons of fish will arrive at the processing plants in edible condition annually. This reduction in spoilage represents a gross savings to the packers of $36,000 since this is paid to the fishermen prior to spoilage. The net benefits would represent the difference in profit derived from the present utilization of 900 tons of spoiled fish for fertilizer or other products and the utilization of the same quantity of edible fish for sardines.

No further studies by this Service will be required unless there is a change in the plans for spoil disposal. If alternate spoil disposal areas are selected, we would like to have notification sufficiently in advance of contract letting to enable us to appraise the effects of spoil on fish and wildlife, and if advisable, to prepare a new report.

Sincerely yours,

John S. Gottschalk
Regional Director
Bureau of Sport Fisheries & Wildlife

Russell T. Norris
Acting Regional Director
Bureau of Commercial Fisheries

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
59 TEMPLE PLACE
BOSTON, MASSACHUSETTS

ADDRESS ONLY THE
REGIONAL DIRECTOR

NORTHEAST REGION
(REGION 5)
MAINE
NEW HAMPSHIRE
NEW YORK
VERMONT
PENNSYLVANIA
MASSACHUSETTS
NEW JERSEY
RHODE ISLAND
DELAWARE
CONNECTICUT
WEST VIRGINIA

November 16, 1961

Division Engineer
New England Division
U. S. Army Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Dear Sir:

This report supplements the information on fish and wildlife resources presented in our conservation and development report dated August 22, 1961, on your navigation study of the Narraguagus River, Maine. These findings have the concurrence of the Maine Department of Inland Fisheries and Game, the Maine Department of Sea and Shore Fisheries, and the Atlantic Sea Run Salmon Commission.

Suitable spawning habitat for Atlantic salmon in the United States has dwindled to a few coastal streams in Maine. Federal and State agencies have expended a considerable amount of funds and time in their continuing efforts to preserve the attractiveness of these streams for spawning populations of Atlantic salmon. Siltation from dredging activities may interfere with the salmon migration.

It would be desirable to schedule dredging operations so as to avoid any possible interference with this migration. No dredging should be scheduled for the periods of April 15 to July 1 and October 1 to November 15. During the spring period young salmon (smolt) are making their initial migration from fresh water to the sea and also some salmon (kelt) that spawned the previous fall and have spent the winter in fresh water are returning to the sea. During this period many adult salmon (bright) are migrating from the sea into the river where they will remain until they begin spawning in the fall. Both fresh-run fish and the kelts provide sport fishing opportunities for anglers. The adult fish that did not ascend the river in the spring will do so during the fall period and will begin spawning almost immediately. Also during this period some of the salmon that have spawned will return to the sea.

The movement of Atlantic salmon is not limited to the periods stated. For example, a hard winter and a late spring could necessitate Atlantic salmon

movement into July. Ideal water flows and temperatures in late August and early September could attract Atlantic salmon at an earlier date. If dredging activities can be completed in 2 months, dredging should be confined to the period from July 15 to September 15. This scheduling would afford better protection to fish that may enter the river in early July or September.

You indicate that hydraulic dredging and disposal of spoil material on selected shore sites appear to be the most economical means of deepening the channel. It is our understanding that the spoil materials will be suitably contained behind barriers to prevent the seepage of silt into the Narraguagus River. We can foresee no significant damages to fish and wildlife resources if the spoil material is placed along the banks on either side of the channel from Wyman to Milbridge.

No further studies by this Bureau will be required unless alternate spoil disposal areas are selected. Should alternate spoil disposal areas be selected, we would like to have notification sufficiently in advance of construction to prepare a new fish and wildlife report.

We appreciate the opportunity to report on this project.

Sincerely yours,

E. W. Bailey
Acting Regional Director

NARRAGUAGUS RIVER, MAINE

Information called for by
Senate Resolution 148, 85th Congress,
Adopted 28 January 1958.

1. Navigation Problem - Narraguagus River is located in Washington County about 11 miles west of Jonesport and 22 miles east of Bar Harbor. Although the river is tidal about 6 miles to the Town of Cherryfield, a low-level bridge crossing the river at Milbridge limits navigation above that point. The river is used by commercial fishing boats and by a few recreational boats in the summer months. Three sardine canneries are located on the river, one near the mouth and the other two at Milbridge. The river channel is winding and is not deep enough for the carriers bringing fish to the cannery docks, except at higher tide stages.

2. Improvements Considered. - Local interests requested a channel 11 feet deep from deep water in Narraguagus Bay to the anchorage known as "Deep Hole", thence 9 feet deep to the bridge at Milbridge with anchorage near a public landing to be developed at Milbridge.

3. Improvement Recommended. - The plan of improvement selected as best fitting the present and reasonably prospective needs of navigation and the desires of local interests consists of dredging a channel 11 feet deep 150 feet wide from deep water in Narraguagus Bay to Wyman, 9 feet deep 100 feet wide to Milbridge and widened at Milbridge for anchorage, and 6 feet deep 100 feet wide to the proposed Town landing and widened for anchorage near the landing. Local interests would provide a public landing in the vicinity of Milbridge with attendant facilities, spoil areas, and improve berths and docks. Construction of the recommended plan would eliminate delays for loaded herring carriers, which would reduce fish spoilage and increase the fish catch. The straighter channel would reduce damages from groundings on channel banks during periods of low visibility.

4. First Cost. - The estimated Federal first cost of the recommended improvement based on March 1962 price levels is $500,000 exclusive of preauthorization study costs of $7,000 and aids to navigation of $2,000. Non-Federal costs are estimated at $5,000 for spoil areas, $10,000 for the public landing, and $11,000 for berth and dock improvements.

5. Annual Costs and Benefits. - The estimated annual charges are based on a 100 year anticipated project life, a 2-5/8% interest rate on Federal funds, and an interest rate of 4% for 25 years on the non-Federal investment for spoil areas.

a. Estimated Annual Charges

Federal

Interest and Amortization	$14,400
Maintenance (Dredging)	7,500
Maintenance (Aids to Navigation)	400
	$22,300

Non-Federal

Interest and Amortization	300
TOTAL	$22,600

b. Estimated Annual Benefits

Increased fish catch	$14,400
Savings thru reduction of spoilage	21,600
Total Benefits	$36,000

c. Benefit-Cost Ratio 1.6

6. Apportionment of Cost and Local Cooperation. - Since all evaluated benefits are general in nature, the entire cost of the channel improvement should be borne by the Federal Government. This improvement is recommended subject to the requirements that local interests: (a) Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the project and of aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general interest for initial and subsequent disposal of spoil and necessary retaining dikes, bulkheads and embankments therefor or the cost of such retaining works. (b) Hold and save the United States free from damages due to construction and maintenance of the project; (c) Provide and maintain at local expense a suitable public landing at Milbridge with adequate supply facilities open to all on equal terms in accordance with plans approved by the Chief of Engineers, and (d) Provide and maintain without cost to the United States adequate docking facilities at the terminals with berth depths commensurate with the Federal channel.

7. Discussion. - Local interests have been consulted and have approved the recommended plan and also indicated that the requirements of local cooperation will be met. Proposed local cooperation is consistent with other similar projects. The project is considered justifiable on the basis of data in the report and criteria for similar navigation projects. The recommended measures provide a logical and economically feasible plan of meeting the current and anticipated needs of navigation on the waterway.